COMMONWEALTH of VIRGINIA

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MEMORANDUM

Subject: Virginia Water Protection Permit Number 08-0572, Smith Mountain Project, Public Hearing

To: The State Water Control Board

From: Ellen Gilinsky, Ph.D., Water Division Director

Date: September 25, 2008

Background

The Smith Mountain Project (Project) consists of two lakes, Leesville and Smith Mountain, bordering Franklin, Bedford, Pittsylvania and Campbell County. The lakes were formed in 1964 when the Roanoke River was dammed in two locations by Appalachian Power Company (APCO).

Smith Mountain Lake (SML) is the upper lake and has a surface area of 20,600 acres. Leesville Lake is the smaller lower lake and has a surface area of 3,270 acres. The two lakes together impound 400 billion gallons of water. The Project has 536 megawatts (MW) of installed turbine capacity at Smith Mountain Dam and 47.5 MW of installed capacity at Leesville Dam. The Project is utilized as a peaking facility. During off-peak demand periods water is pumped from the lower Leesville Lake for utilization during peak demand periods. This back and forth water transfer can produce a maximum intraday lake level fluctuation of 1.9 feet in SML and 13 feet in Leesville Lake.

The Federal Power Commission issued the original license to APCO in 1960 with an expiration date of March 31, 2010. APCO began working on relicensing in 2003 and after several years of studies filed an application for a new license to the Federal Energy Regulatory Commission (FERC) in March 2008. At the same time, APCO applied to DEQ for a Section 401 Water Quality Certificate. Section 401 of the Clean Water Act requires that any applicant for a federal license for an activity that results in a discharge to navigable waters, present to the licensing agency a certificate from the state in which the discharge originates that certifies that the activity will be in compliance with the State's water quality standards and laws. Conditions in the

Section 401 certificate become mandatory conditions of the Federal license. In this case the Federal license is the FERC hydropower license and the discharge in question is the water discharged from the dams through the hydroelectric turbines. In Virginia, issuance of a Virginia Water Protection Permit shall constitute the certification required under § 401 of the Clean Water Act. The Clean Water Act was passed in 1972 so this is the first opportunity that the State has had to condition this project.

In the original license issued by the Federal Power Commission, a minimum release of 650 cfs was required from Leesville Dam to the Staunton River. In a drought such a minimum release would cause SML to fall 5 feet or more before winter and spring high flows would refill the project. When few people lived around the lake such drops were tolerated. As more and more people moved to live on the lake or near the lake, pressure was brought to bear on regulatory agencies to do something about low lake levels during the droughts. APCO estimates that there are 7,400 homes built on SML which are home to 10,500 residents.

The process leading up to this permit decision began in November 2002 with the first meeting between APCO and stakeholders. In 2003 APCO elected to seek the license under a new regulatory procedure called the new Integrated Licensing Process. In 2004 APCO filed the Pre Application Document (PAD) which describes the project location, facilities and operations and its environmental and resource impacts. Public Meetings were held in May and July. In 2005 APCO conducted scoping to determine the issues for studies based on comments on PAD. A study plan was developed. In September 2005 FERC made the determination that the study plan was adequate. Study work groups were formed and were open to whoever wanted to participate.

Public meetings on planning and progress of the studies were held in January 2005, May 2005, March 2006 and September 2007. Individual workgroups meetings were held more frequently. Draft and final study reports were prepared between 2005 and 2007. The subjects of the studies were aquatic weeds and littoral zone habitat, historic resources, debris, drinking water, flood and drought management, navigation, recreation, erosion and sedimentation, entrainment, instream flow needs, the endangered Roanoke Log Perch, water quality, angler use and socioeconomics.

The most important studies for this permit were the instream flow needs study and the drought management study. Work groups for these studies contained representatives from DEQ, the Department of Conservation and Recreation, the Department of Game and Inland Fisheries, the Tri County Relicensing Committee, Smith Mountain Lake Association and the Roanoke River Basin Advisory Committee. Downstream stakeholders were represented by J.T. Davis, Cole Poindexter, Ted Bennett and Ward Burton, all of whom are riparian landowners and representatives of Dominion Power. Also occasionally attending work group meetings were the Corps of Engineers, the U.S. Fish and Wildlife Service, the Director of the Western Virginia Water Authority representing municipal water suppliers, representatives of the Smith Mountain Lake Safety Council and representatives of the Smith Mountain Lake Marine Fire Department. The full drought management workgroup met 10 times between March 27, 2007 and February 21, 2008. Subsets of the full group met an additional five times. Work group meetings were assisted by Hydrologics, Inc. which maintained an interactive simulation model from which meeting participants could get immediate feedback on the efficacy of their release proposals.

On March 27, 2008, DEQ received APCO's application for a Virginia Water Protection Permit. DEQ sought and received comments and recommendations from State Agencies and prepared a draft permit. DEQ and APCO came to agreement on the final terms of the draft permit on June 3, 2008 and DEQ gave APCO permission to notice a public hearing on June 10, 2008. A public notice for a hearing was published on July 2, 2008 in the Smith Mountain Eagle and in the Brookneal Union Star.

A public hearing for the proposed issuance of VWP Permit Number 08-0572 was held on August 7, 2008 at Gretna High School. John Thompson served as the hearing officer for the public hearing. Because an estimated 2000 persons were in attendance, the hearing was moved from the auditorium to the football stadium. Approximately 75 persons spoke at the public hearing. A total of 598 written comments were received during the comment period.

A detailed Summary of the comments received in writing and at the hearing, as well as staff responses to comments, can be found in Attachment 2

Major features of the draft permit

The draft permit memorializes an instream release protocol known as HL-8 (with HL standing for Hydrologics, the consulting firm that developed the model for APCO with input from the stakeholders groups). The important components of the draft permit are as follows:

- A phased approach is presented: as a drought worsens, the minimum releases are reduced, instead of having a single minimum release which was a feature of the last license.
- A time of year sensitive minimum release: streamflow naturally drops in the summer and fall, and rises in the winter and spring; therefore the target flows for aquatic life in the permit reflect these natural cycles.
- A probabilistic approach to setting minimum releases: the model uses an algorithm that takes into account inflow, the present storage condition, the time of year and the prospects of future inflows based upon the streamflow records of the past, and sets the minimum releases accordingly.
- An approach that takes into account the timing of recreation: under drought conditions minimal recreation flows are only provided on weekends between Memorial Day and Labor Day. In trigger 2 drought conditions minimal recreation flow is provided for only 12 hours during daylight on Saturdays. No recreation flows are specified outside of these times.
- An approach which takes into account the flows of tributaries below Leesville Dam: If Goose Creek and Big Otter Creek are running strong, releases from Leesville Dam will be reduced in order to conserve water in the lake while still meeting instream flow targets for aquatic life downstream.
- Adaptive management: the permit features a condition that allows DEQ to grant a variance if Trigger 3 activates. The draft permit requires that the permittee hold a public meeting on the performance of the operating protocol in protecting lake levels and instream beneficial uses five years after the protocol is implemented and report back to DEQ with any recommendations for modification.

Staff Recommendation

Based on the comments received, staff recommends that the following changes be made to the draft permit. The revised permit language is contained in Attachment 1.

1) Modify Trigger 3. As currently written it activates only under the worst drought conditions after December 1st and only if there is a 2% chance that the project would drop to 790 feet adjusted anytime within the next 10 weeks. We recommend that Trigger 3 also activate whenever the project drops to 791 feet adjusted, regardless of the time of year or probability of falling to 790 feet adjusted. We also will fix the typographical in this condition.

2) Add a condition that requires APCO to build up the spring surcharge by April 15th of each year, to the extent that inflows allow. A standard practice has been to fill up Smith Mountain Lake and then fill and hold an extra 2 billion gallons of water in Leesville Lake above its normal level every spring. This extra water, called the spring surcharge is used to meet the higher flow requirements for Striped Bass Spawning. The draft permit did not mention this standard practice. Based on the record to date, inflows would allow the building of a surcharge in almost every year, with the possible exception of major drought years such as 1931 and 2002.

3) Make three changes to the proposed flowby rule condition, now condition D.6.

a. Add a condition that allows APCO to switch from the higher May minimum instream flow targets to the lower June targets as soon as DGIF determines that the striped bass have finished spawning. This is needed because the spawn sometimes ends before June 1. DGIF operates a hatchery at Brookneal and they are in communication with AEP every spring on the status of the spawn.

b. Add a condition that requires APCO to provide flow for river recreation not just on Saturdays and Sundays in the summer, but also on Memorial Day, the Fourth of July and Labor Day.

c. Add caps on the amount of water that APCO has to release to meet the downstream target flows. The minimum release would become a range in the months that caps apply. This will allow for the minimum release to be in the bottom of the range when downstream contributing tributaries are flowing stronger and in the higher end of the range when downstream flow is weak. The caps are applied in the critical months of June through November when we are trying for recreation reasons to maintain the lake at a reasonably high level. The caps are set between 80 and 200 cfs below the target at Brookneal and vary by month. If the contributing drainage area below the dam is not producing the 80 to 200 cfs of flow, then storage in the Project will not be required to reach the target.

4) Add a condition that requires APCO to monitor erosion downstream of Leesville dam and prepare a corrective action plan if project fluctuations are causing continued and excessive erosion.

Attachment 1

VWP Individual Permit No. 08-0572
Part I - Special Conditions

A. *Authorized Activities*

This permit authorizes the following impacts as indicated in the application dated March 25, 2008, received by DEQ on March 27, 2008, and deemed complete by DEQ on May 2, 2008. The permit authorization and conditions are also based on additional submittals approved by DEQ.

1. The discharge of water from Leesville Lake to the Staunton River for the production of hydroelectricity.

2. The discharge of water from Smith Mountain Lake to Leesville Lake for the production of hydroelectricity.

3. The discharge of pumped water from Leesville Lake to Smith Mountain Lake for the purpose of storing the potential energy of the pumped water.

B. *Permit Term*

This permit is valid for 15 years from the effective date.

C. *Standard Project Conditions*

1. The activities authorized by this permit shall be executed in such a manner that any impacts to stream beneficial uses are minimized. As defined in § 62.1-10(b) of the Code, "beneficial use" means both instream and offstream uses. Instream beneficial uses include, but are not limited to, the protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values. Offstream beneficial uses include, but are not limited to, domestic (including public water supply), agricultural, electric power generation, commercial, and industrial uses. Public water supply uses for human consumption shall be considered the highest priority.

2. Flows downstream of the project area shall be maintained to protect all uses.

3. Measures shall be employed at all times to prevent and contain spills of fuels, lubricants, or other pollutants into surface waters.

4. Virginia Water Quality Standards shall not be violated in any surface waters as a result of the project activities.

5. All required notifications and submittals shall be submitted to the DEQ office stated below, to the attention of the VWP permit manager, unless directed in writing by DEQ subsequent to the issuance of this permit:

   Department of Environmental Quality
   Office of Wetlands and Water Protection
   P. O. Box 1105
   Richmond, VA 23218

6. All reports required by this permit and other information requested by DEQ shall be signed by the permittee or a person acting in the permittee's behalf, with the authority to bind the permittee. A person is a duly authorized representative only if *both* criteria below are met. If a representative authorization is no longer valid because of a change in responsibility for the overall operation of the facility, a new authorization shall be immediately submitted to DEQ.

   a. The authorization is made in writing by the permittee.

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, superintendent, or position of equivalent responsibility. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

7. All submittals shall contain the following signed certification statement:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

8. Any fish kills or spills of fuels or oils into Smith Mountain Lake by the permittee shall be reported to DEQ immediately upon discovery to the West Central Regional Office Pollution Response Program at (540) 562-6723. Any fish kills or spills of fuels or oils by the permittee into Leesville Lake or the Staunton River shall be reported to DEQ immediately upon discovery to the South Central Regional Office Pollution Response Program at (434) 582-6236. If DEQ cannot be reached, the spill shall be reported to the Virginia Department of Emergency Management (DEM) at 1-800-468-8892 or the National Response Center (NRC) at 1-800-424-8802

9. The permittee shall notify DEQ of any additional impacts to surface waters, including wetlands; of any modifications to the discharge works; and of any change to the type

of surface water impacts associated with this project. Any additional impacts, modifications, or changes shall be subject to individual permit review and/or modification of this permit.

D. *Instream Flow Conditions*

1. The following instream flow conditions become effective upon issuance of a new Federal Energy Regulatory Commission License to Appalachian Power Company for FERC project P-2210.

2. The minimum release from Leesville Lake shall not be less than 375 cubic feet per second in terms of average hourly flow from November 1st through February 29th and 400 cfs in terms of average hourly flow from March 1st through October 31st.

3. During periods when the required discharge is less than one generating unit's discharge, a generating unit at Leesville Lake shall be operated on an hourly auto-cycle basis to provide the required flow. In case the generating units are out of service, the release may be made from a spillway gate.

4. The permittee shall run a forecast based simulation model at least once every three days and evaluate the probability of being at a certain elevation into the future. Trigger 1 will activate when there is a 20% chance of dropping below 790.5' (adjusted) in 16 weeks. Trigger 2 will activate when there is a 2% chance of dropping below 790' (adjusted) in 10 weeks. Trigger 3 will activate if Trigger 2 is in effect and the reservoir is less than 795' (adjusted) between December 1 and March 31, or anytime the adjusted elevation drops below 791.0' regardless of the month. All triggers are lifted if the elevation has reached 795'(adjusted) and there is less than a 2% chance of dropping below 790.5' (adjusted) sixteen weeks from that time.

5. To the extent that inflows allow, the permittee shall store additional water in Leesville Lake so that the adjusted storage shall be equal to 795.3 feet adjusted by April 15th of each year. The extra 0.3 feet of storage is intended to be used to ensure the success of the striped bass spawning run and need not be retained past the end of that run unless the permittee chooses to do so, while still complying with minimum instream flowby requirements.

6. The permittee shall release water at Leesville in an attempt to meet the target flows listed in the table below. Target flows are measured at the Brookneal gage, USGS number 02062500 and expressed in units of cubic feet per second. The permittee shall estimate tributary flows between Leesville and Brookneal when running the forecast based model and use such estimates in determining releases from Leesville when attempting to meet the target flows at Brookneal.

	Normal	Trigger 1	Trigger 2	Trigger 3
January	1100	990	990	770
February	1100	990	990	770
March	1100	935	825	770
April	1500	1275	1200	1050
May	1500[4]	1275	1200	1050
June	900 [1,5]	765 [2,6]	765 [3,6]	630
July	700 [1]	595 [2,7]	560 [3,7]	490
August	See note 1	570 [2,7]	570 [3,7]	420
September	550	550[7]	550[7]	385
October	600	570[7]	570[7]	420
November	700	595[7]	560[7]	490
December	800	720	720	560

Notes:

1. Minimum release at Leesville of 650 cfs, in terms of an average hourly flow.
2. The minimum release of 650 cfs at Leesville will be made on Saturdays and Sundays and on Memorial Day, July 4th and on Labor Day for recreation. Appalachian shall time the release in an attempt to make it arrive at Long Island at 8 AM on Saturday and to subside at Brookneal at 8 PM on Sunday
3. A minimum release of 650 cfs will be made at Leesville for 12 hours timed to arrive at approximately sunrise at Long Island on Saturdays and on July 4th and on Labor Day.
4. Upon notification by the Department of Game and Inland Fisheries that Striped Bass spawning is complete, the permittee may reduce releases and only be required to make release for the June normal target flow of 900 cfs
5. The maximum release that the permittee is required to release in attempting to hit the target flow at Brookneal is 700 cfs.
6. The maximum release that the permittee is required to release in attempting to hit the target flow at Brookneal is 650 cfs
7. The maximum release that the permittee is required to release in attempting to hit the target flow at Brookneal is 480 cfs

E. *Adaptive Management*

1 If required by operating emergencies beyond the control of the permittee, and/or when Trigger 3 events occur during drought and/or low inflow conditions, flows can be temporarily modified from those described in Section D upon mutual agreement between the licensee and DEQ, in consultation with the Virginia Department of Game and Inland Fisheries, following appropriate public input as determined by DEQ.

2. Within five years after the date that the instream flow conditions become effective, the permittee shall hold a public meeting in the vicinity of the project and accept

comments on the performance of the project in maintaining lake levels and in providing flows necessary to protect instream beneficial uses. The permittee shall summarize the comments and provide them to DEQ along with any recommendations that the permittee might have. DEQ may, at its discretion, and depending on the comments, elect to exercise its right to reopen the permit pursuant to State Law and Regulation.

F. *Dissolved Oxygen Conditions, Monitoring and Reporting*

1. The permittee shall operate the turbines at Smith Mountain Dam from July1st through September 30th in a fashion that will minimize or eliminate violations of water quality standards for dissolved oxygen in the tail waters below Smith Mountain Dam. During this time period, the permittee will dispatch the turbines with intakes that are highest in the water column first and take those turbines off line last when generating.

2. Within 120 days of the effective date of the permit, the permit shall provide for DEQ approval a monitoring plan designed to determine the timing and extent of potential contraventions of the water quality standards for dissolved oxygen in Leesville Lake caused by late summer and fall hydroelectric generation from discharges from Smith Mountain Lake. The monitoring plan shall include but not be limited to the location of monitoring stations and the frequency of monitoring.

3. Within five years of the effective date of this permit, the permittee shall provide DEQ a report on Summer and Fall Dissolved Oxygen Monitoring in Leesville Lake during Generation at Smith Mountain Dam. The report shall summarize the effects of generation on Leesville lake dissolved oxygen levels.

4. If the first on, last off generation practices required by condition F.1, are not successful in eliminating dissolved oxygen contraventions of water quality standards caused by turbine discharge, the permittee shall submit a feasibility study and plan for physical or mechanical alterations of water release procedures that will eliminate violations of water quality standards for dissolved oxygen caused by turbine discharge from Smith Mountain Lake. The feasibility study will be due by December 31, 2015 unless the operational changes alone are sufficient to eliminate contraventions of the dissolved oxygen standard.

G. *Instream Flow Monitoring and Reporting Conditions*

1. The permittee shall monitor on a daily basis, adjusted storage levels in the project lakes, inflow to the project, downstream side flows between Leesville Dam and Brookneal and releases from the project to the Staunton River.

2. The permittee shall file an annual report with DEQ that tabulates by date, the status of the project in terms of the trigger condition in effect, the adjusted elevation, the mean daily release at Leesville and the target flow required by the table in condition D.5. The report shall be submitted by January 31st for the previous calendar year.

H. Erosion Monitoring, Reporting and Mitigation below Leesville Dam

The permittee shall conduct an erosion monitoring program below Leesville Dam. The purpose of the monitoring program is to determine whether the auto-cycling of discharges is continued causing excessive erosion along the banks of the Staunton River within five miles downstream of the dam.

1. The Erosion Monitoring Plan will be implemented within three month's of the FERC's approval of the Plan.

2. The permittee shall establish 10 monitoring stations between Leesville Dam and Altavista at the locations described in the Appalachian Power Company Smith Mountain Project 2201 Erosion Monitoring Plan, Appendix C dated July 2008. GPS data will be collected to ensure that the same sites are monitored each time. An additional monitoring station no more than one mile downstream of the dam will also be established.

3. Monitoring will be accomplished by taking photographs and surveying bank pins semi-annually.

4. The monitoring frequency may be reduced to annual monitoring should the results show that erosion increments are minimal between semi-annual monitoring events.

5. The initial survey will be completed within two year's following the Commission's approval of the Erosion Monitoring Plan

6. Photographic documentation of the monitoring sites downstream of Leesville Dam will be compared to previous photographic documentation. Initial and final results of bank pin measurements will also be compared. A narrative comparison will be made of observed differences in photographic evidence and height of bank pins between monitoring events.

7. A report will be submitted to DEQ within six months of completion of the initial survey. The report will contain:
   - the survey results,
   - photos and an assessment of the erosion rates at the monitored sites,
   - identification of any project related erosion effects,
   - a corrective action plan detailing actions to be taken to address any project-related erosion effects , including a schedule to address the observed deficiencies,
   - documentation of consultation with stakeholders in the development of the report, including at a minimum DEQ, DCR and DGIF,
   - updates to the monitoring plan and schedule, if any, including identifying the dates of the next anticipated survey.